

# **HIGH-FREQUENCY TWO-DIMENSIONAL ANTENNA AND ASSOCIATED DOWN-CONVERSION METHOD**

## **ABSTRACT OF THE DISCLOSURE**

5           A high-frequency two-dimensional antenna includes a plurality of dual-  
frequency antennas configured to receive signals having first and second frequencies  
above the microwave band of the electromagnetic spectrum. The dual-frequency  
antennas of the two-dimensional antenna are arrayed to an effective length to re-  
radiate signals at a third frequency, which is down-converted from the first and  
10   second frequencies. Each dual-frequency antenna of the two-dimensional antenna  
includes a plurality of dipole antennas, and a plurality of nonlinear resonant circuits.  
The nonlinear resonant circuits interconnect the dipole antennas and are configured to  
permit re-radiation of signals having the third frequency over the effective length. A  
method of down-converting signals having at least first and second electromagnetic  
15   radiation frequencies is also provided.